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NEVERITA RECLUSIANA (DESH.) AND ITS ALLIES

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This large Californian naticid snail was described and very well figured by Deshayes in Guerin's *Magasin de Zoologie* for 1841, plate 37. He called it "Natica de Recluz, *N. Reclusiana*." The same orthography was used on the plate, evidently because Z was considered out of place in classical Latin, appearing only in words transliterated from Greek. The spelling "recluziana" by modern authors is an unauthorized alteration of what Deshayes intended, and should be discarded.

The original type measured 85 mm. long, 65 wide. This is about the maximum size, I would suppose, being larger than any specimen I have seen. The usual size is shown in plate 6, fig. 1, a specimen from San Pedro. The umbilicus is always partly open, and the callus is white or sometimes faintly tinged with brown outwardly. The callus varies in shape as shown in the figures in Chenu's *Illustrations Conchyliologiques*; it leaves part of the umbilicus open.

The range of typical *reclusiana* is given by Dall as from Crescent City in northern California to the Tres Marias Islands, Mexico, and Chile (on the authority of Phillipi). The series of *N. reclusiana* before me is deficient in specimens of the typical form south of San Pedro. I have not seen any from Lower California or western Mexico. The record of *reclusiana* from Chile appears very dubious.

In 1909 Dall briefly defined two varieties: *Neverita re-*

cluziana var. *alta* and *N.r.* var. *imperforata* Stearns. The former had been noticed by Arnold in 1903. Var. *imperforata* seems to have been taken from a collection label. As these forms have never been fully defined or figured some consideration of them may not be superfluous.

Besides the specimens in the collection here I have received a long series from Mr. H. N. Lowe, who writes as follows: "In January, 1928, I secured a nice lot of live specimens of variety *alta* in Newport Bay. I think they had come in to spawn, for this form seems to live most of the time in deeper water. I also include a lot of dead specimens from Alamitos Bay (washed ashore) and examples from Ensenada, San Diego and Morro Bay. In looking these over I have never found any specimens which intergrade with the typical form, or are at all doubtful. The callus at the base in var. *alta* seems to be always brown. Do you not think this form worthy of specific rank?"

NEVERITA ALTA ('Dall' Arnold). Pl. 6, figs. 5-9.

[*Polynices (Neverita) recluziana*] var. *alta* Dall, Arnold, Paleontology and Stratigraphy of the Marine Pliocene and Pleistocene of San Pedro, California, in Mem. Cal. Acad. Sci. III, 1903, p. 315.

[*Neverita recluziana*] var. *alta* Dall, Miocene of Astoria and Coos Bay, Oregon, U.S.G.S. Prof. Pap. 59, 1909, p. 88.

Polinices recluziana alta Dall, Oldroyd, Mar. Shells W. Coast N. A., II, pt. 3, 1927, p. 130.

It ranges from Monterey, according to Dall, to San Diego (Lowe).

Arnold originally described this form as "a variety with an elevated spire" from the "Upper San Pedro" Pleistocene of San Pedro. Dall's definition is "with small narrow shell and exceptionally elevated spire", no type locality mentioned. Both definitions are inadequate.

By the kindness of Dr. W. P. Woodring of the California Institute of Technology, Pasadena, I have been able to examine series of the Pleistocene *Neveritae* from Pacific and Oliver Streets, San Pedro, and from Upper Potrero Canyon, one-fourth mile south of Pacific Palisades P. O. There

are two forms, corresponding to Arnold's var. *alta* and to the var. *imperfurata*, which Arnold described and figured as *P. reclusiana*. The former agrees fully with living specimens except in the loss of color, and I have selected one of the lot from the "Upper San Pedro" at Pacific and Oliver Streets as a neotype, length 27 mm., diam. 25 mm. *N. reclusiana* proper is not known from these beds.

In the recent specimens the umbilicus varies in size but is always partially open and deep. *The umbilical callus is brown* (rarely partly white). The callus in some specimens, such as those figured from Newport Bay, pl. 6, figs. 5, 6, is long and tongue-shaped at the end. In others, pl. 6, figs. 7, 8, 9, Alamitos Bay, it has the usual shape in *N. reclusiana*. Such variations are seen also in our Eastern *N. duplicata*. The groove on the callus is very variable, and is rarely obsolete, as in pl. 6, fig. 8.

Length 39 mm., width 34 mm. Fig. 7.

Length 37 mm., width 33 mm. Fig. 9.

Length 35 mm., width 30 mm. Fig. 8.

Length 26.5 mm., width 23 mm. Fig. 5.

The question of whether this is to be considered a distinct species or a form of *N. reclusiana* requires consideration. If it occurs with the large typical form I would think it specifically different. If the two occupy distinct ecologic stations, however, that might possibly be thought to account for the differences in the shells, though I would not expect to find them differing in the same way in many localities if the difference was due to station. Those having the opportunity to collect them should publish their observations on the special localities and habitats of both forms. I do not think there is much doubt that *alta* should be given specific rank.

Those who do not use the double author citation will call this form *Neverita alta* (Arnold).

NEVERITA RECLUSIANA IMPERFORATA 'Stearns' Dall. Pl. 6, figs. 2, 3, 4.

Polynices (*Neverita*) *reclusiana* Petit, Ralph Arnold,

Paleont. and Stratig. Mar. Pliocene and Pleistocene of San Pedro, Cal., Mem. Cal. Acad. Sci. III, 1903, p. 314, pl. 10, fig. 12.

[*Neverita reclusiana*] variety *imperfurata* Stearns, Dall, U.S.G.S. Prof. Pap. 59, 1909, p. 88.

Polinices reclusiana imperfurata Stearns, Oldroyd, Mar. Shells W. Coast N. A., II, pt. 3, 1927, p. 129.

This form appears to have been noticed first by Dr. Stearns, who apparently applied the name *imperfurata* to specimens in his collection, but did not mention it in his published work so far as I know. It was first figured by Arnold, who called it *reclusiana*.

In shape the shell is smaller and generally more depressed than *reclusiana*, but it varies to forms equally high. The parietal and umbilical callus is white, or there may be a faint brown tint towards the outer margin; old ones have a brown streak on the callus contiguous to the posterior part of the outer lip. The callus covers the umbilicus typically, as in fig. 4, but in some samples the closure is not complete, a small shallow or deep pit being left open. The shell is smaller than *reclusiana*, the diameter usually 30-40 mm., but sometimes it reaches a larger size. Some apparently adult shells are much smaller, down to about 20 mm. diameter.

Length 50 mm., width 44 mm.

Length 36 mm., width 40 mm.

Length 54 mm., width 53 mm.

Length 35 mm., width 34 mm.

Length 19 mm., width 22 mm.

Length 25 mm., width 27 mm.

The specimens figured are from Newport Bay, collected by H. N. Lowe. The Pleistocene specimen figured by Arnold and those sent by Woodring from Pacific and Oliver Sts., San Pedro, are small and agree with the living shells from Newport Bay.

As in the case of *alta*, the status of this form is rather uncertain. Typically it seems to be very distinct, but specimens with the umbilicus not completely closed are somewhat transitional. The comparison of long series is needed;

also observations on the ecologic station, and whether it is associated in life with *reclusiana*.

Neveritae having a grooved umbilical callus are found nearly all around the Pacific, from Japan to Australia on the western side as well as on our shores. It might be well to segregate them as a new section, GLOSSAULAX, with *N. reclusiana* as type.

It is hoped that Californian naturalists who have opportunity to collect the several forms discussed above will send in the results of their observations.

PLATE 6

- Fig. 1. *Neverita reclusiana* (Dh.). Typical. San Pedro.
 Figs. 2-4. *Neverita r. imperforata* 'St.' Dall. Newport Bay. Fig. 3 is the neotype. 147436.
 Figs. 5-6. *Neverita alta* ('Dall' Arnold), Newport Bay.
 Figs. 7-9. *Neverita alta* ('Dall' Arnold), Alamitos Bay.

CYPHOXIS RAFINESQUE, A CRETACEOUS TAXODONT IDENTICAL WITH IDONEARCA CONRAD

BY HENRY A. PILSBRY

In his "Prodrome de 70 nouveaux Genres, Etats-Unis d'Amérique", published in *Journal de Physique, de Chimie, d'Histoire Naturelle*, vol. 88, June, 1919, Rafinesque defined the 52d genus thus:

"CYPHOXIS. (Biv. foss.) Different du genre *Arca* par valves très bombées, les sommets basilaires bossus, recourbés, séparés par un grand intervalle; un sillon oblique, courbé, extérieur, latéral et postérieur.—Plusieurs espèces, telles que *C. venerina*, *cardites*, *pulla*, *lunula* etc. Dans les couches de grès, de marne, etc."

Herrmannsen referred *Cyphoxis* to *Arca*, a course fol-